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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/089,698	06/03/98	SPITZ	D LE9-97-123

MM42/0924  
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EXAMINER

BROOKE, M

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 09/24/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
**09/089,698**

Applicant(s)  
**Askren et al.**

Examiner  
**Michael S. Brooke**

Group Art Unit  
**2853**



☐ Responsive to communication(s) filed on \_\_\_\_\_.

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-39 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-39 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## **DETAILED ACTION**

### ***Drawings***

1. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.
2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show " a TAB circuit" as described on page 12, lines 28-29 of the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Correction is required.
3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "TAB circuit" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

### ***Specification***

4. The disclosure is objected to because of the following informalities: The term "polyxylenene" is misspelled. It appears that it should be spelled polyxylylene.

Appropriate correction is required.

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***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 6, 7, 14-30 and 36-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claims 6, 7, 19, 20, 29, 30, 36 and 37:**

- The term "polyxyelene" is ambiguous as there is no such chemical. It appears that the term should be "polyxylylene." The Examiner has considered this to be the case for the purposes of examination.

**Claims 14 and 25:**

- "the substrate holder" lacks antecedent basis.

**Claim 23:**

- The language "one or more carriage positioning devices" is ambiguous, as it is unclear whether they are the same as the "at least two alignment devices" recited in lines 7-9 of claim 14. Also, it appears that claim 23 contradicts claim 14 in that claim 14 recites "one or more" devices, while claim 14 recites "at least two devices."

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***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 4, 5, and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Hara et al.

Wong discloses an ink jet print head comprising a substrate support panel (50) having a recess (48) for accommodating and cooling a semi-conductor substrate (12). As can be seen in Fig. 8, the support panel has a top surface and side walls which define a cylindrical first opening (100) which is located opposite the top surface. Plastic alignment pins are provided adjacent the side walls for attaching the panel to holes in a plastic ink cartridge (10) which is positioned adjacent to the support panel. As can be seen in Fig. 4, holes are provided in the cartridge which mate with the alignment pins for the purpose of securing the support panel to the ink cartridge. Alignment pins (98) which have a rectangular pyramid shape with a rectangular base are provided for the purpose of aligning the panel with a printer. Wong further discloses the use of a TAB circuit (136) which is connected to the substrate and top surface of the carrier.

Wong discloses the claimed invention with the exception of the side walls having fins, the ink container being formed integrally with the substrate holder, a coating of silicon dioxide, and the silicon dioxide having a thickness of between 0.1 to 2.5 microns.

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Hara et al. discloses an ink jet print head containing a heating resistor (142) mounted on a substrate. A heat discharging fin (148) is located on a side of the print head for the purpose of convectively removing heat from the print head which was generated by the heating resistor (col. 35, lines 39-57). Furthermore, a layer of silicon dioxide (141) having a thickness of 3 microns is provided over a base plate (140) for the purpose of providing thermal insulation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed the ink reservoir integrally with the substrate holder, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together requires only routine skill in the art (*Howard v. Detroit Stove Works*, 150 U.S. 164 (1893)). Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong a side wall having fins for convectively removing heat from the substrate and a coating of silicon dioxide having a thickness of between 0.1 to 2.5 microns for the purpose of providing thermal insulation as suggested by Hara et al.

9. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Hara et al., as applied to claims 1, 4 and 10-12 above, and further in view of Fukuda et al.

Wong, as modified by Hara et al., discloses the claimed invention with the exception of the substrate holder comprising a metal selected from the group consisting of aluminum, beryllium, copper, gold, silver, zinc, tungsten and alloys of two or more of the foregoing metals.

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Fukuda et al. discloses an ink jet print head comprising a heat sink (1) made of aluminum for the purpose of cooling a heat generating substrate (10) (col. 6, lines 10-18).

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong a substrate holder comprising a metal selected from the group consisting of aluminum, beryllium, copper, gold, silver, zinc, tungsten and alloys of two or more of the foregoing metals for the purpose of cooling a heat generating substrate.

10. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Hara et al., as applied to claims 1, 4, 5 and 10-12 above, and further in view of Wenzel et al.

Wong, as modified by Hara et al., discloses the claimed invention with the exception of the a coating of polyxylylene, the polyxylylene coating having a thickness of about 0.1 to 10 microns.

Wenzel et al. discloses an ink jet print head having a coating of polyxylylene with a thickness of between 0.5 and 5 microns for the purpose of forming a corrosion resistant layer.

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong the polyxylylene coating having a thickness of about 0.1 to 10 microns for the purpose of forming a corrosion resistant layer as taught by Wenzel et al.

11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Hara et al., as applied to claims 1, 4, 5 and 10-12 above, and further in view of Drake et al.

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Wong, as modified by Hara et al., discloses the claimed invention with the exception of the substrate holder comprising a material containing carbon fibers or graphite.

Drake et al. discloses a semi-conductor substrate having a heat sink (12.1) made of graphite for the purpose of cooling the substrate (col., 5, lines 16-18).

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong a substrate holder comprising graphite for the purpose of cooling the substrate.

12. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Hara et al., as applied to claims 1, 4, 5 and 10-12 above, and further in view of Cook.

Wong, as modified by Hara et al., discloses the claimed invention with the exception of the substrate holder comprising a metal-ceramic composite.

Cook discloses a heat sink comprising a composite of a metal matrix and a ceramic for the purpose of improving the thermal conductivity of the heat sink so as to reduce its size.

It would have been recognized in the art of Wong that reducing the size of a heat sink would be desirable so as to reduce the overall size of the print head.

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong a substrate holder comprising a metal-ceramic composite for the purpose improving the thermal conductivity of the substrate holder, so as to reduce the size of the print head.



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13. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Hara et al., as applied to claims 1, 4, 5 and 10-12 above, and further in view of Ta et al.

Wong, as modified by Hara et al., discloses the claimed invention with the exception of one or more carriage positioning devices adjacent one of the side walls of the substrate holder.

Ta et al. discloses a print head cartridge and carriage assembly. Each ink cartridge (20) has alignment features provided on the front of the cartridge and on the inside of a face plate (16) of a carriage housing (12) (col. 4, lines 59-68 and col. 5., lines 1-22). The alignment features on the cartridge engage the alignment features of the face plate for the purpose of preventing misalignment of the ink cartridge. As can be seen in Fig. 10, the alignment features (78) are positioned adjacent to the portion of the cartridge which holds a print head mechanism.

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong one or more carriage positioning devices adjacent one of the side walls of the substrate holder for the purpose of preventing misalignment of the ink cartridge.

14. Claims 14, 17, 18 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Hara et al., and Ta et al.

Wong discloses the invention, as discussed above, with the exception of the side walls having fins, the ink container being formed integrally with the substrate holder, a coating of silicon dioxide, the silicon dioxide having a thickness of between 0.1 to 2.5 microns, and one or more carriage positioning devices adjacent one of the side walls of the substrate holder.

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Hara et al. and Ta et al. disclose the claimed invention as discussed above.

Therefore, it has been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong side wall fins for convectively removing heat from the substrate and a coating of silicon dioxide having a thickness of between 0.1 to 2.5 microns for the purpose of providing thermal insulation as suggested by Hara et al., and one or more carriage positioning devices adjacent one of the side walls of the substrate holder for the purpose of preventing misalignment of the ink cartridge as taught by Ta et al.

15. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Hara et al., Ta et al., as applied to claims 14, 17, 18 and 24 above, and further in view of Fukuda et al.

Wong, as modified by Hara et al., and Ta et al., discloses the claimed invention with the exception of the substrate holder comprising a metal selected from the group consisting of aluminum, beryllium, copper, gold, silver, zinc, tungsten and alloys of two or more of the foregoing metals.

Fukuda et al. discloses an ink jet print head comprising a heat sink (1) made of aluminum for the purpose of cooling a heat generating substrate (10) (col. 6, lines 10-18).

Therefore, it has been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong a substrate holder comprising a metal selected from the group consisting of aluminum, beryllium, copper, gold, silver, zinc, tungsten and alloys of two or more of the foregoing metals for the purpose of cooling a heat generating substrate.

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16. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Hara et al., and Ta et al., as applied to claims 14, 17, 18 and 24 above, and further in view of Wenzel et al.

Wong, as modified by Hara et al., and Ta et al., discloses the claimed invention with the exception of the coating of polyxylylene, the polyxylylene coating having a thickness of about 0.1 to 10 microns.

Wenzel et al. discloses an ink jet print head having a coating of polyxylylene with a thickness of between 0.5 and 5 microns for the purpose of forming a corrosion resistant layer.

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong the polyxylylene coating having a thickness of about 0.1 to 10 microns for the purpose of forming a corrosion resistant layer as taught by Wenzel et al.

17. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Hara et al. and Ta et al., as applied to claims 14, 17, 18 and 24 above, and further in view of Drake et al.

Wong, as modified by Hara et al. and Ta et al. discloses the claimed invention with the exception of the substrate holder comprising a material containing carbon fibers or graphite.

Drake et al. discloses a semi-conductor substrate having a heat sink (12.1) made of graphite for the purpose of cooling the substrate (col., 5, lines 16-18).

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Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong a substrate holder comprising graphite for the purpose of cooling the substrate.

18. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Hara et al. and Ta et al., as applied to claims 14, 17, 18 and 24 above, and further in view of Cook.

Wong, as modified by Hara et al. and Ta et al., discloses the claimed invention with the exception of the substrate holder comprising a metal-ceramic composite.

Cook discloses a heat sink comprising a composite of a metal matrix and a ceramic for the purpose of improving the thermal conductivity of the heat sink so as to reduce its size.

It would have been recognized in the art of Wong that reducing the size of a heat sink would be desirable so as to reduce the overall size of the print head.

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong a substrate holder comprising a metal-ceramic composite for the purpose improving the thermal conductivity of the substrate holder, so as to reduce the size of the print head.

19. Claims 25-28 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Fukuda et al. and Ta et al.

Wong discloses the claimed invention with the exception of the substrate holder comprising a metal selected from the group consisting of aluminum, beryllium, copper, gold,

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silver, zinc, tungsten and alloys of two or more of the foregoing metals, and one or more carriage positioning devices adjacent one of the side walls of the substrate holder.

Fukuda et al. and Keefe et al. discloses the features as discussed above.

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong a substrate holder comprising a metal selected from the group consisting of aluminum, beryllium, copper, gold, silver, zinc, tungsten and alloys of two or more of the foregoing metals for the purpose of cooling a heat generating substrate as taught by Fukuda et al., and one or more carriage positioning devices adjacent one of the side walls of the substrate holder for the purpose of preventing misalignment of the ink cartridge as suggested by Ta et al.

20. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Fukuda et al. and Ta et al., as applied to claims 25-28 and 31 above, and further in view of Wenzel et al.

Wong, as modified by Fukuda et al. and Ta et al., discloses the claimed invention with the exception of the coating of polyxylylene, the polyxylylene coating having a thickness of about 0.1 to 10 microns.

Wenzel et al. discloses an ink jet print head having a coating of polyxylylene with a thickness of between 0.5 and 5 microns for the purpose of forming a corrosion resistant layer.

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong a polyxylylene coating having a thickness of

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about 0.1 to 10 microns for the purpose of forming a corrosion resistant layer as taught by Wenzel et al.

21. Claims 32, 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of in view of Hara et al. and Keefe et al.

Wong discloses the claimed invention, as above, with the exception of at least one of sides of the substrate carrier having a substantially planar surface extending from the substrate surface essentially perpendicular there to for containing contact pads, and at least two of the four side containing cooling fins.

Hara et al. discloses the claimed invention as above. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provided additional cooling fins on different sides of the substrate carrier, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art (St. Regis Paper Co. v. Bemis Co., 193 USPQ 8).

Keefe et al. discloses an ink jet print cartridge comprising a TAB circuit (18) which cover a printer cartridge headland (50). As can be seen in Fig. 6, the TAB circuit, having electrical contact pads (20), extends along the sides of the cartridge so that it is generally perpendicular to the substrate for the purpose of reducing the size of the printer cartridge. This would suggest to one having ordinary skill in the art at the time the invention was made that the TAB circuit disclosed in Wong could be extended along the sides of the ink cartridge for the purpose of

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reducing the size of the printer cartridge. Therefore, the TAB circuit would extend essentially perpendicular to the side of the substrate holder.

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong at least one of sides of the substrate carrier having a substantially planar surface extending from the substrate surface essentially perpendicular there to for containing contact pads cartridge for the purpose of reducing the size of the printer cartridge.

22. Claims 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of in view of Hara et al. and Keefe et al., as applied to claims 32, 38 and 39 above, and further in view of Fukuda et al.

Wong, as modified by Hara et al. and Keefe et al., discloses the claimed invention with the exception of the substrate holder comprising a metal selected from the group consisting of aluminum, beryllium, copper, gold, silver, zinc, tungsten and alloys of two or more of the foregoing metals.

Fukuda et al. discloses an ink jet print head comprising a heat sink (1) made of aluminum for the purpose of cooling a heat generating substrate (10) (col. 6, lines 10-18).

Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong a substrate holder comprising a metal selected from the group consisting of aluminum, beryllium, copper, gold, silver, zinc, tungsten and alloys of two or more of the foregoing metals for the purpose of cooling a heat generating substrate.

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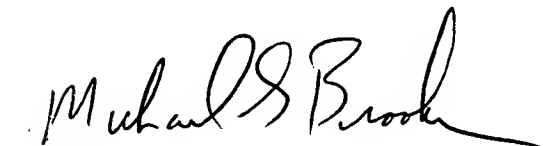
23. Claims 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of in view of Hara et al. and Keefe et al., as applied to claims 32, 38 and 39 above, and further in view of Wenzel et al.

Wong, as modified by Hara et al. and Keefe et al., discloses the claimed invention with the exception of the coating of polyxylylene, the polyxylylene coating having a thickness of about 0.1 to 10 microns.

Wenzel et al. discloses an ink jet print head having a coating of polyxylylene with a thickness of between 0.5 and 5 microns for the purpose of forming a corrosion resistant layer.

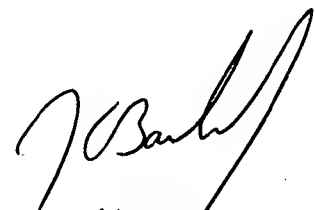
Therefore, it have been obvious to one having ordinary skill in the art at the time the invention was made to have provided in Wong a polyxylylene coating having a thickness of about 0.1 to 10 microns for the purpose of forming a corrosion resistant layer as taught by Wenzel et al.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael S. Brooke whose telephone number is (703) 305-0262.



MSB

September 14, 1999



John Barlow  
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